



## Environmental Product Declaration

# New Aeron® Chair

### Design Story

#### Designed by Bill Stumpf and Don Chadwick, 1994

When designers Bill Stumpf and Don Chadwick set out to create a chair that was health-positive, cross-performing, inclusively-sized, and environmentally sensitive, they arrived at a design unlike the world had ever seen. Aeron demonstrated a pioneering step in ergonomics and material innovation, and provided a comfortable solution without the standard use of foam, fabric, or leather. It changed people's perception of what an office chair could be—and in doing so it soon found a place in popular culture.

#### Remastered by Don Chadwick, 2016

Fast forward to the present, and the same criteria serve as the foundation for a whole new Aeron. Just as iconic films and albums are updated for new mediums, standards, and audiences, Aeron has been remastered based on Herman Miller's latest research around the science of sitting, advancements in materials, manufacturing, and technology, and today's world of work.

The office of 1994 would be largely unrecognizable today. With all the changes that have occurred, it only made sense that Aeron should also change to better meet the needs of today's work, workers, and workplaces.



#### Environmental Data

- 39% Recycled Content
- 38% Post Consumer
- 1% Pre Consumer
- Up to 91% Recyclability \*

#### Life Cycle Assessment Data

- 87 kg CO<sub>2</sub>e<sub>q</sub> Global Warming
- 0.29 kg SO<sub>2</sub>e<sub>q</sub> Acidification
- 0.025 kg Neq Eutrophication
- 3.8 kg O<sub>3</sub>e<sub>q</sub> Smog
- 1500 MJ Primary Energy Demand
- 1.2 X 10<sup>-7</sup> kg CFC-11e<sub>q</sub> Ozone Depletion

#### Environmental Certifications

- BIFMA level™ 3
- CRADLE TO CRADLE CERTIFIED™ Silver
- GREENGUARD Certified
- GREENGUARD GOLD Certified

#### Warranty

Backed by Herman Miller's 12-year, 24/7 warranty

#### Manufactured

Herman Miller Greenhouse, Holland, MI 49424  
ISO 14001/OHSAS 18001  
Greenhouse manufacturing facility uses 100% Renewable Electric Energy (through the purchase of Renewable Energy Certificates).

#### Disclaimer

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs or different calculation models may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results due to and not limited to the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.

#### Company Description

Herman Miller creates inspiring designs to help people do great things at work, for learning, for wellness, at home, wherever people are. Our designs and the designers who work with us solve real problems for people and their organizations. This way of thinking about design has led us to be recognized as an innovator in furnishings, personal work accessories, and strategic services.

#### Our Sustainability Goals

We will be Resource Smart, Eco-inspired, and Community Driven.

##### Resource Smart

- Zero Waste
- Net Zero Water
- Net Zero Energy

##### Eco-inspired Design

- All products designed for the environment
- All products BIFMA level 3 certified
- Closed-Loop recycling of used product

##### Community Driven

- All employees engaged in Earthright
- All suppliers committed to being Resource Smart

#### LEED

Please refer to [www.hermanmiller.com/ecoscorecard](http://www.hermanmiller.com/ecoscorecard) for detailed LEED information.

#### Packaging

Returnable packaging is available for the new Aeron Chair.

#### Supplier Support

At Herman Miller, we are committed to working closely with our suppliers to reduce our collective impact on the environment. We encourage our suppliers to minimize their operations' environmental impacts and require they assist us in decreasing our facilities' environmental effects.

#### Design for the Environment Criteria

Our commitment to corporate sustainability naturally includes minimizing the environmental impact of each of our products. Our Design for the Environment team applies environmentally sensitive design standards to both new and existing Herman Miller products, and goes beyond regulatory compliance to thoroughly evaluate new product designs in key areas:

##### • Material Chemistry and Safety of Inputs

What chemicals are in the materials we specify, and are they the safest available?

##### • Disassembly

Can we take products apart at the end of their useful life, to recycle their materials?

##### • Recyclability

Do the materials contain recycled content, and more importantly, can the materials be recycled at the end of the product's useful life?

##### • Life Cycle Assessment (LCA)

Have we optimized the product based on the entire life cycle?

# New Aeron Chair

## MATERIAL DECLARATION

### Functional Unit

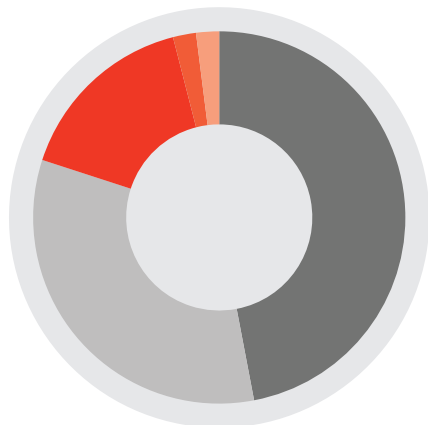
One unit of seating for one individual, maintained over a 10-year period, including packaging materials used for the final assembled product.

### Reference Flow and Product Description

One new Aeron Chair (product number AER1B13AWAL) with plastic base, arms, casters, posterfit, and Pellicle fabric—intended for use in North America—was modeled for this EPD.

### Content Declaration

The chart to the right details the materials included in the product.



### Total Material Components

- Plastic 47%
- Aluminum 33%
- Steel 16%
- Foam 2%
- Epoxy Glass 2%

Material	Mass (kg)	Mass (%)	Resource
Acrylonitrile Butadiene Styrene (ABS)	0.271	2%	Virgin Non-renewable
Aluminum	6.38	33%	Recycled Content
Epoxy Glass	0.285	2%	Virgin Non-renewable
HDPE	0.002	0%	Virgin Non-renewable
LDPE	0.005	0%	Virgin Non-renewable
PA6 (Nylon 6)	0.401	2%	Virgin Non-renewable/ Recycled Content
PA6/6 (Nylon 6/6)	0.188	1%	Virgin Non-renewable
PA6 (30% GF)	3.611	19%	Virgin Non-renewable
PA6 (33% GF)	0.126	1%	Virgin Non-renewable
PA6 (40% GF)	2.717	14%	Virgin Non-renewable
PA6/6 (30% GF)	0.026	0%	Virgin Non-renewable
PBT	0.024	0%	Virgin Non-renewable
POM	0.414	2%	Virgin Non-renewable
Powdercoat	0.072	0%	Virgin Non-renewable
PP (Polypropylene)	0.097	1%	Virgin Non-renewable
PP (20% GF)	0.258	1%	Virgin Non-renewable
PU (Polyurethane)	0.385	2%	Virgin Non-renewable
Rubber	0.008	0%	Virgin Renewable
Steel	3.121	16%	Recycled Content
TEEE	0.828	4%	Virgin Non-renewable
TPE (Thermoplastic elastomer)	0.077	0%	Virgin Non-renewable
Zinc	0.005	0%	Recycled Content
<b>Total</b>	<b>19.323</b>	<b>100%</b>	

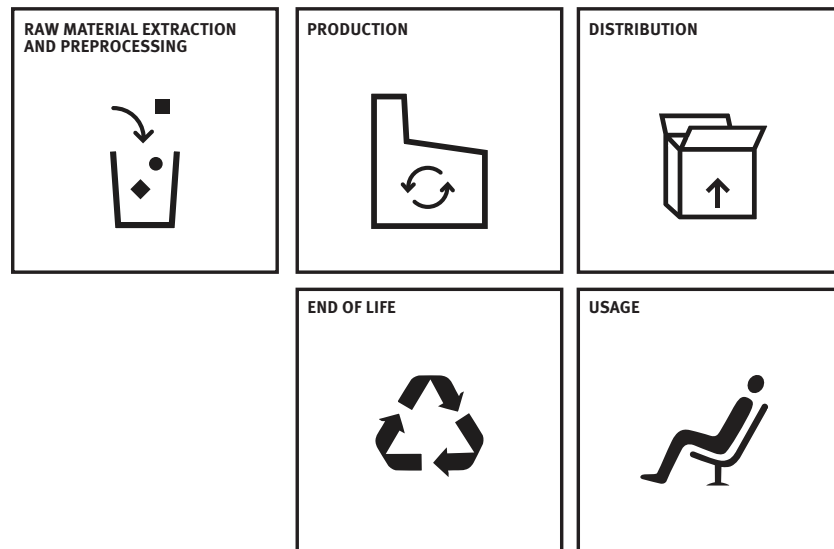
### Packaging\*

Corrugate	4.76	99%	Recycled Content
PE Film	0.011	0%	Virgin Non-renewable
PP Banding (Polypropylene)	0.022	1%	Virgin Non-renewable
<b>Total</b>	<b>4.793</b>	<b>100%</b>	

\*Returnable/reusable shipping blankets also available.

## New Aeron Chair

### LIFE CYCLE ASSESSMENT



### ENVIRONMENTAL PRODUCT DECLARATION SYSTEM BOUNDARIES

Cradle to grave, including transportation.

#### Product

This EPD covers the new Aeron Chair produced for use in North America at Herman Miller's GreenHouse manufacturing plant in Holland, Michigan. The EPD applies to all colors of the new Aeron Chair with five star plastic base, height adjustable seat, fully adjustable arms with non-upholstered polyurethane foam arm pads, posture fit support, casters, tilt limiter and seat angle adjustment.

#### Raw Material Extraction and Preprocessing

The raw materials stage covers the extraction and production of the raw materials needed to manufacture the product. It includes the processing of the extracted raw material to the point where it can be made into a recognizable part, as well as transportation of the finished raw material to the part production factory.

#### Production

Materials are converted into parts and assemblies and made into the final product. This stage, often referred to as Gate to Gate, includes packaging of the final product and transport of parts and assemblies to the place of final product assembly and packaging.

#### Distribution

Transport of the product to the final customer, including retail and warehousing. Herman Miller products generally ship directly from the manufacturing plant to the final customer and are not sent to retail or warehousing.

#### Usage






Use, maintenance, and regular cleaning of the product. Herman Miller seating products are generally cleaned with a dry or damp rag and do not typically require maintenance during their warranted lifetime.

#### End of Life

End of life treatment of the product including landfill, recycling, waste-to-energy process, and transportation to the place of final disposal or recycling. We design our products to be easily disassembled and recycled; however, in this study, our product was modeled using the national average recycling values. As a result, more of our materials were modeled as going to the landfill than should occur in actual practice. Herman Miller also offers programs to help our customers find homes for their furniture and materials at end of life.






## New Aeron Chair

### Life Cycle Environmental Impacts

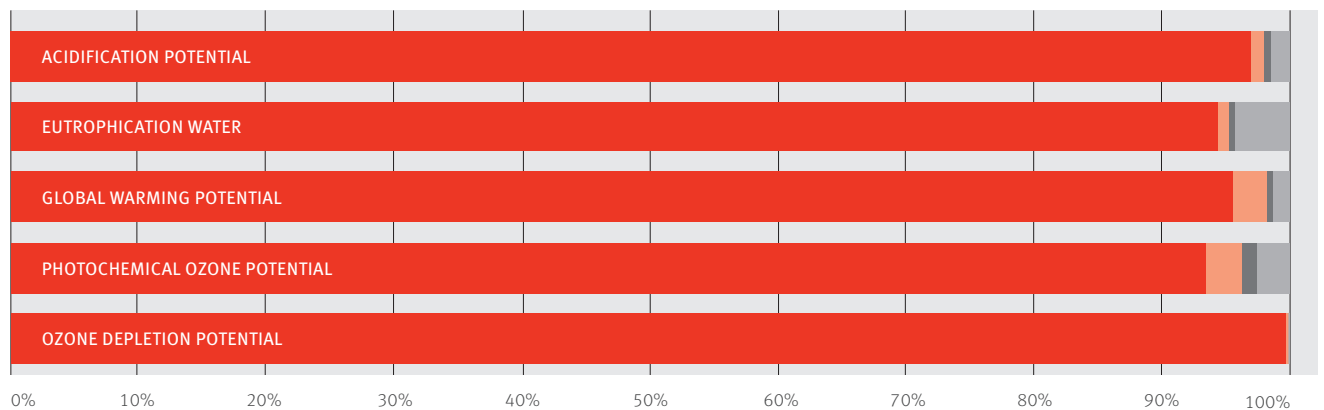
	Impact Category	Unit	Total	Methodology
	<p><b>Acidification Potential</b></p> <p>Atmospheric deposition of substances that can cause a change of acidity in the soil. Changes in levels of acidity can cause a shift of species to occur.</p>	kg SO <sub>2</sub> -eq	0.29	TRACI 2.1 as based on ASTRAP (Shannon 1991, 1992)
	<p><b>Eutrophication Water</b></p> <p>Nutrient enrichment of the aquatic environment that impacts its ecological quality of water.</p>	kg nitrogen-eq	0.03	TRACI 2.1 as characterized by the Redfield Ratio Model (1963)
	<p><b>Global Warming Potential (100 Years)</b></p> <p>A measure of the potential of emitted gasses to cause an increase in the radiative forcing potential of the atmosphere leading to climate change.</p>	kg CO <sub>2</sub> -eq	87	TRACI 2.1 as characterized by IPCC 2001, 2007
	<p><b>Photochemical Ozone Creation Potential (Smog)</b></p> <p>Air pollution derived from man-made emissions to the atmosphere that can potentially cause ground level ozone.</p>	kg O <sub>3</sub> -eq	3.8	TRACI 2.1 as based on Carter, W.SAPRC Atmospheric Chemical Mechanisms and VOC reactivity scale (2010)
	<p><b>Ozone Depletion Potential</b></p> <p>Air pollution from man-made emissions to the atmosphere that have the ability to destroy ozone that protects the earth from UV sun-rays.</p>	kg CFC-11 eq	1.2 x 10 <sup>-7</sup>	TRACI 2.1 based on Handbook for the International Treaties for the Protection of the Ozone Layer (UNEP-SETAC 2000)

# New Aeron Chair

## Detailed Life Cycle Impact Assessment

	LCIA Results	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
	Acidification Potential	kg SO <sub>2</sub> -eq	2.9x10 <sup>-1</sup>	2.8x10 <sup>-1</sup>	3.3x10 <sup>-3</sup>	1.3x10 <sup>-3</sup>	4.3x10 <sup>-3</sup>
	Eutrophication Water	kg nitrogen-eq	2.5x10 <sup>-2</sup>	2.4x10 <sup>-2</sup>	2.4x10 <sup>-4</sup>	1.2x10 <sup>-4</sup>	1.0x10 <sup>-3</sup>
	Global Warming Potential (GWP 100 years)	kg CO <sub>2</sub> -eq	8.7x10 <sup>1</sup>	8.3x10 <sup>1</sup>	2.3x10 <sup>0</sup>	2.9x10 <sup>-1</sup>	1.19x10 <sup>0</sup>
	Photochemical Ozone Creation Potential (Smog)	kg O <sub>3</sub> -eq	3.8x10 <sup>0</sup>	3.5x10 <sup>0</sup>	1.0x10 <sup>-1</sup>	4.2x10 <sup>-2</sup>	9.5x10 <sup>-2</sup>
	Ozone Depletion Potential	kg CFC-11-eq	1.2x10 <sup>-7</sup>	1.1x10 <sup>-7</sup>	1.02x10 <sup>-10</sup>	2.0x10 <sup>-12</sup>	3.4x10 <sup>-11</sup>

## Life Cycle Impacts of the new Aeron Chair Product



### Detailed Life Cycle Assessment

- Raw Material Production
- Product Production
- Distribution and Retail
- End of Life

# New Aeron Chair

## Detailed Life Cycle Inventory

LCI Results	Unit	Total	Raw Material Production	Product Production	Distribution and Retail	End of Life
<b>Energy Demand</b>						
Primary Energy	MJ	$1.5 \times 10^3$	$1.4 \times 10^3$	$3.2 \times 10^1$	$4.1 \times 10^0$	$1.7 \times 10^1$
Fossil Fuel Energy	MJ	$1.4 \times 10^3$	$1.3 \times 10^3$	$3.2 \times 10^1$	$4.1 \times 10^0$	$1.6 \times 10^1$
Nuclear Energy	MJ	$4.6 \times 10^1$	$4.6 \times 10^1$	$3.5 \times 10^{-2}$	$1.7 \times 10^{-2}$	$5.1 \times 10^{-1}$
Renewable Energy	MJ	$4.5 \times 10^1$	$4.4 \times 10^1$	$9.1 \times 10^{-2}$	$6.7 \times 10^{-2}$	$1.0 \times 10^0$
<b>Waste</b>						
Waste to Landfill	kg	$1.8 \times 10^1$	$0.0 \times 10^0$	$0.0 \times 10^0$	$0.0 \times 10^0$	$1.8 \times 10^1$
Waste to Incinerator (energy recovery)	kg	$1.1 \times 10^{-1}$	$0.0 \times 10^0$	$1.1 \times 10^{-1}$	$0.0 \times 10^0$	$0.0 \times 10^0$
Waste to Incinerator (without energy recovery)	kg	$0.0 \times 10^0$	$0.0 \times 10^0$	$0.0 \times 10^0$	$0.0 \times 10^0$	$0.0 \times 10^0$
Waste to Recycling	kg	$6.5 \times 10^0$	$0.0 \times 10^0$	$6.0 \times 10^{-1}$	$0.0 \times 10^0$	$5.6 \times 10^0$
Hazardous Waste	kg	$1.5 \times 10^{-2}$	$1.4 \times 10^{-2}$	$1.4 \times 10^{-5}$	$7.0 \times 10^{-6}$	$2.0 \times 10^{-4}$
<b>Other</b>						
Consumptive Water Use	kg	$1.1 \times 10^4$	$1.0 \times 10^4$	$2.5 \times 10^1$	$1.2 \times 10^1$	$5.3 \times 10^2$

# New Aeron Chair

## EPD and LCA Creation and Verification

The EPD and LCA were created by Herman Miller's Design for the Environment Team.

## References

PCR for Environmental Product Declarations Seating: UNCF 3811, Valid through September 26, 2021.

Recycling and disassembly instructions can be found at [hermanmiller.com/products/seating/performance-work-chairs/aeron-chairs.html](http://hermanmiller.com/products/seating/performance-work-chairs/aeron-chairs.html)

LCA for new Aeron Chair, September 2016

ISO 14025:2006 Environmental labels and Declaration - Type III Environmental Declaration - Principles and Procedures.

## PCR REVIEW:

### Herman Miller, Inc.

Reference PCR: Product Category Rule for Environmental Product Declaration BIFMA PCR for Seating. Valid through September 26, 2021.

PCR Review was conducted by: NSF International by an LCA expert panel chaired by Tom Gloria, Industrial Ecology Consultants. Email [ncss@nsf.org](mailto:ncss@nsf.org) for any PCR questions.

This EPD was based on the September, 2016 LCA for the Aeron Chair. The LCA was independently verified in accordance with ISO 14044 and the PCR by an external reviewer.

This Declaration was independently verified in accordance with ISO 14025 and the PCR.

Internal

External

Rita Schenck

Name



Signature

Rita Schenck

Name



Signature

### September 26, 2016

EPD Approved Date

### September 26, 2021

EPD valid through.

Program Operator (Earthsure) [iere.org/programs/earthsure/](http://iere.org/programs/earthsure/)



### Manufacturer's contact information

[www.hermanmiller.com/contact](http://www.hermanmiller.com/contact)



### GREENGUARD Certified

Products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information visit [ul.com/gg](http://ul.com/gg).



### level® Certification

The level conformance mark ensures a comprehensive, independent, and impartial assessment of the environmental and social impacts of a product.



### Cradle to Cradle Certified™ Program

A multi-attribute program that assesses products for safety to human & environmental health, design for future use cycles, and sustainable manufacturing processes.